



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

**5 Post Office Square, Suite 100
BOSTON, MA 02109-3912**

JUL 30 2015

**CERTIFIED MAIL –
RETURN RECEIPT REQUESTED**

Mr. Bill Finch, Mayor
City of Bridgeport
Margaret E. Morton Government Center
999 Broad Street
Bridgeport, CT 06604

Re: Request for Information Pursuant to Section 308 of the Clean Water Act, EPA Docket No. 308-15-01-29

Dear Mr. Finch:

The Environmental Protection Agency ("EPA") conducted a joint sanitary sewer overflow audit with the Connecticut Department of Environment and Energy Protection ("CTDEEP") of the Water Pollution Control Authority ("WPCA") in Bridgeport, CT on November 4th and 5th, 2014. To supplement the audit the EPA is seeking additional information, including information about the City of Bridgeport's ("City") Municipal Separate Storm Sewer System ("MS4").

Section 308(a) of the Federal Clean Water Act (the "Act"), 33 U.S.C. § 1318(a), authorizes the EPA to require any owner or operator of a point source to provide information needed to determine whether there has been a violation of the Act. Accordingly, the City of Bridgeport ("City") is hereby required, pursuant to Section 308(a) of the Act, 33 U.S.C. § 1318(a), to respond to this Request for Information (the "Request") in accordance with the schedules provided herein. Please read the instructions in Attachment No. 1 carefully before preparing your response and answer each question in Attachment No. 2 as clearly and completely as possible.

Your response to this Request must also be accompanied by a certificate that is signed and dated by the person who is authorized to respond to the Request. A Statement of Certification, Attachment No. 3, is attached to this letter.

Information submitted pursuant to this Request shall be sent both in hard copy and electronic copy by certified mail and shall be addressed as follows:

United States Environmental Protection Agency

New England Region
5 Post Office Square Suite 100 (OES 04-04)
Boston, MA 02109-3912
Attn: Alex Rosenberg
rosenberg.alex@epa.gov

and an **electronic copy only** shall be addressed as follows:

State of Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06109
Attn: Dennis Greci, Supervising Sanitary Engineer
dennis.greci@ct.gov

Compliance with this Request is mandatory. Failure to respond fully and truthfully, or to adequately justify any failure to respond, within the time frame specified above, also constitutes a violation of the Clean Water Act subject to enforcement action, including the assessment of penalties. In addition, providing false, fictitious, or fraudulent statements or representations may subject you to criminal prosecution under 18 U.S.C. § 1001.

The City may assert a business confidentiality claim with respect to part or all of the information submitted to EPA in the manner described at 40 C.F.R. Part 2.203(b). Information covered by such a claim will be disclosed by EPA only to the extent, and by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when it is submitted to EPA, the information may be made available to the public by EPA without further notice to the City.

If you have questions regarding this Request, please contact Alex Rosenberg of my staff at 617-918-1709 or have your attorney contact Michael Wagner at 617-918-1735.

Sincerely,



James Chow, Manager
Technical Enforcement Programs
Office of Environmental Stewardship

Attachments

Cc: William Robinson, City of Bridgeport – WPCA
Kim Hudak, CTDEEP

Attachment No. 1

Information Request

1. Please provide a separate narrative response to each and every question and subpart of a question set forth in this Request. Precede each answer with the text and the number of the question and the subpart to which the answer corresponds.
2. If any question cannot be answered in full, answer to the extent possible. If your responses are qualified in any manner, please explain.
3. Any documents referenced or relied upon by you to answer any of the questions in the Request must be copied and submitted to EPA with your response. All documents must contain a notation indicating the question and subpart to which they are responding. If the documentation that supports a response to one item duplicates the documentation that supports another item, submit one copy of the documentation and reference the documentation in subsequent responses
4. If information or documents not known or not available to the City as of the date of the submission of its response to this Request should later become known, or available to the City, the City must supplement its response. Moreover, should the City find at any time after the submission of its response that any portion of the submitted information is false or misrepresents the truth, the City must notify the EPA and the Connecticut Department of Energy and Environmental Protection ("CTDEEP") of this fact as soon as possible and provide a corrected response.

Attachment No. 2
Respond to the Following

With respect to the wastewater collection system owned by the City of Bridgeport, provide the following information by **October 1, 2015** unless otherwise specified:

I. Dry-Weather Bypasses and Overflows

Submit a Dry-Weather Overflow Report. The Dry-Weather Overflow Report shall provide the following information for all dry-weather overflows that occurred since January 1, 2014.

- A. Provide a listing of all dry-weather overflows, bypasses, spills, releases, or discharges of raw or partially-treated wastewater to surface waters from the City's wastewater collection system (the "Collection System") that occurred at locations at which the City was authorized by its NPDES permit to discharge combined sewer overflows ("CSOs"). The listing and descriptions shall be organized chronologically and shall include all such events regardless of cause, including, but not limited to, roots, grease, debris, and vandalism blockages as well as mechanical, electrical and structural failures.
- B. For each discharge identified in response to Item I.A., above, submit copies of all notifications, including internal communications such as memos, e-mails, phone logs, police logs, and citizen complaints and external communications such as letters to the CTDEEP, and e-mail messages of each overflow, spill, release or discharge of pollutants to surface waters.
- C. For each discharge identified in response to Item I.A., above provide the following information:
 - 1. The location at which the dry-weather discharge occurred;
 - 2. A schematic of the appurtenant Collection System facilities, including the regulator, if any, designed to control discharges at the location;
 - 3. The date and time on which the discharge event began and was stopped or if it is continuing, an estimated schedule for its termination. Include a description of the corrective action;
 - 4. The receiving water of each discharge;
 - 5. The conditions under which the discharge occurs;
 - 6. An estimate of the total number of dry-weather discharges annually, the estimated total annual volume, and the cause(s) of discharge at the location;

7. A description of efforts made to reduce and/or eliminate the frequency and duration of dry-weather overflow events at the location, including operation and maintenance efforts and construction activities and their related costs; and
 8. The length of time over which the dry-weather discharges occur at each location.
- D. Provide a listing and description of all bypasses, overflows, spills, releases including building/private property backups from the City's Collection System that occurred during dry weather at locations for which the City is not authorized by its NPDES permit to discharge wastewater. The listing and descriptions shall be organized chronologically and shall include all such bypasses, overflows, spills, releases regardless of cause including, but not limited to, capacity limitations, roots, grease, debris, and vandalism blockages as well as mechanical, electrical, and structural failures.

II. Wet-Weather Bypasses and Overflows

Submit a Wet-Weather Overflow Report. The Wet-Weather Overflow Report shall provide the following information for all wet-weather overflows that occurred since January 1, 2014:

- A. A listing and description of all bypasses, overflows, spills, releases including building/private property backups from the City's Collection System that occurred during, or as a result of, wet weather at locations for which the City is not authorized by its NPDES permit to discharge wastewater. The listing and descriptions shall be organized chronologically and shall include all such bypasses, overflows, spills, releases regardless of cause including, but not limited to, infiltration/inflow, capacity limitations, roots, grease, debris, and vandalism blockages as well as mechanical, electrical, and structural failures.
- B. A list of all positive monitoring results, including block tests, that demonstrate flow from the sewer to a surface water has occurred, and i) an explanation of whether the result represented a CSO discharge event, and ii) if it did not represent a CSO event explain what caused the false positive monitoring result. Include the total cumulative rainfall depth in the 48 hours preceding to each CSO block test, or other such positive monitoring result.

III. Bypass and Overflow Documentation

- A. For each event identified in response to Item I.D. and II.A. submit copies of all notifications, including internal communications such as memos, e-mails, phone logs, police logs, and citizen complaints and external communications such as letters, CTDEEP reporting forms, and e-mail messages of each overflow, bypass, spill, and release or discharge of pollutants to surface waters along with the following information:
 1. The date and times that the event began or was discovered/reported, and the date the event was stopped or if it is continuing, a schedule for its termination;
 2. The location, including nearest property address, of each such event;

3. The source of notification (property owner, field crew, police, etc.);
4. The specific cause of the event including, but not limited to, whether it was caused by debris, fats, oils, and grease, or root blockages; collapsed pipes; mechanical, electrical, or structural failures; hydraulic overloads; and/or vandalism;
5. The estimated gallons of wastewater released and the method used to estimate the volume;
6. A clear statement of whether the release did, or did not, reach a storm water catch basin or any other portion of the City's Municipal Separate Storm Sewer System ("MS4"). If the release occurred to the ground or street, regardless of whether the discharge reached any portion of the City's MS4, the City shall provide the distance to the nearest down gradient storm water catch basin and the name of the receiving water to which the catch basin discharges;
7. A clear statement of whether the release did or did not reach any surface water. If the release reached a surface water, the City shall include the name of the surface water and a description of the location where the release reached the surface water;
8. The estimated gallons of wastewater discharged to the MS4 or surface water, and the method used to estimate the volume;
9. The measures taken to stop the overflow and decontaminate the area affected by the overflow;
10. The measures taken to prevent future overflows at the same location;
11. The date the overflow was reported to the CTDEEP by the City; and
12. The date of the last overflow at the same location.

IV. General Documentation

- A. With respect to the above-referenced Wet and Dry-Weather Reports and the Collection System that is owned and operated by the City, provide the following information:
 1. A map(s) of the City's Collection System that identifies the location of all wastewater conveyance and treatment systems including pump stations, lift stations, force mains combined sewer overflow outfall structures and siphons. The map(s) shall clearly depict the size and direction of flow of all sewers and distinguish between combined and sanitary sewers. The map(s) shall also be annotated to contain the location of each Collection System overflow, bypass, spill, and release reported pursuant to Paragraphs I.A., I.C., and II.A. of this Request. Please supplement the information on the map with the location of the following

types of bypasses reported by the City, with color coding to distinguish the different bypass types:

- Dry weather with discharge to receiving waters;
- Wet weather with discharge to receiving waters;
- Dry weather with no discharge to receiving waters;
- Wet weather with no discharge to receiving waters; and

B. A description of the procedure for tracking the frequency, cause and steps to mitigate overflows and bypasses. Include in the description all personnel and their job titles who are involved in the process of responding to overflows or bypasses, as well as those who create and update the Collection System's 'hot list' of problem areas.

V. General information

A. The City's September 2010 Long-term Control Plan eliminates infiltration and inflow ("I/I") management from further consideration. Please identify the inflow from sources other than catchbasins contributing to wet weather flows, including the volume of such contributions.

VI. Wet-Weather Flow Monitoring and Reporting Requirements

A. As required by the City's NPDES permits for discharges from the East Side WPCF (ID CT0101010) and the West Side WPCF (ID CT0100056) during wet-weather events, the City must process as much flow through the WWTF as practicable prior to initiating a bypass. The flow through the secondary treatment facilities (aeration and clarification) must be maximized to 58 MGD at the West Side plant and 24 MGD at the East Side plant. Beyond these flows the City must provide primary treatment to the practical limit of each respective facility. Submit the following with respect to wet-weather flows for the period starting January 1, 2014 through the receipt of this letter:

1. Provide a listing and description, organized chronologically, by treatment plant, in tabular EXCEL format, of all events where wastewater flows bypassed secondary treatment. The listing and descriptions shall include at a minimum:
 - a. The date and time the bypass of secondary treatment began and ended;
 - b. Documentation of sludge judge measurements obtained before, during and after the bypass event. If sludge judge measurements were not used to determine when bypassing should either begin or end explain what other methods were used for this purpose;
 - c. The influent flow rate for the respective wastewater treatment plant at the beginning and end of each bypass event. Include a description of the method used for real-time monitoring of influent flows at both plants;

- d. Bypass flow rate and total volume (for example, measurements recorded at the parshall flume at the West Side plant). Include a description of the method used for real-time monitoring of bypass flows;
 - e. The total (combined, secondary treated plus bypassed flows) effluent flow rate from the respective treatment plant, at both the time each bypass event starts and ends. Include a description of the method used for real-time monitoring of total effluent flows at both plants; and
 - f. A description of and documentation supporting the use of any other flow monitoring or flow control devices that either monitor or effect the influent or effluent flows (such as the level of the manually controlled gate upstream of the West Side plant's head works, and the "street level reports" from the East Side plant) for each bypass event. Explain how these indicators, monitors or controls effect influent or effluent flows.
2. The City shall create and submit, pursuant to the schedule in part VI. 3. below, a chronological spreadsheet in the same format and including the same data detailed in section VI.1. above.
 3. Beginning with the quarter ending September 31, 2015 and continuing through the calendar quarter ending September 31, 2019, submit quarterly reports on the City's bypasses and overflows. Reports shall include information equivalent to that requested in Sections I., II., III., IV., and VI. in both content and format. The reports shall be submitted by the last day of the month following the calendar quarter monitoring period.

VII. CMOM Self-Assessment

- A. Within 180 days of the date of this Request for Information, the City shall complete and submit to the EPA, and to CTDEEP, an assessment of its entire Collection System capacity and its operation and maintenance practices (the "CMOM Program Self-Assessment") to determine whether improvements are necessary in order to preserve the infrastructure of the Collection System and to prevent future Sanitary Sewer Overflows ("SSOs"). The CMOM Program Self-Assessment, shall include completing and submitting the Wastewater Collection System Capacity, Management, Operation, and Maintenance Program Self-Assessment Checklist (the "CMOM Program Self-Assessment Checklist"), which is appended along with accompanying guidance (**Attachment No. 4**).

VIII. MS4

- A. Provide an organization diagram for the City of Bridgeport that shows all City Departments and individuals that are involved with MS4 Permit compliance, including but not limited to the Public Facilities, Planning and Economic Development, Engineering, Environmental Health, and Building departments. Describe the responsibilities of each department and individual included on the organization diagram with respect to MS4 Permit compliance.

- B. Provide a copy of the City's current Stormwater Management Plan ("SWMP") as required pursuant to Section 5.(b) of the MS4 Permit. If the City does not have a current SWMP, provide a schedule for when the City will have one completed.

Illicit Discharge Detection and Elimination (IDDE)

- C. Permit Section 6.(a)(3)(A)(i) requires the City to implement an illicit discharge ordinance. List all instances where the City has utilized the ordinance in an MS4 enforcement context since July 1, 2010. If the City has not used the ordinance in such a manner, explain why it has not done so and whether other regulatory measures are available and have been utilized by City staff for enforcing MS4 requirements.
- D. Permit Sections 6.(a)(3)(B)(i)-(ii) require the City to have developed a series of maps depicting all stormwater discharges from pipes or conduits with a diameter greater than either 12 or 15 inches and the name of the waterbody and watershed into which each discharge flows. Provide an outfall and stormwater infrastructure map demonstrating compliance with the MS4 Permit's mapping requirements. If the City does not have a map that depicts the location of all of its stormwater outfalls, provide a date by which the City will have one completed.
- E. Permit Section 6.(a)(3)(B)(iii) requires the City to implement and enforce a program to detect and eliminate illicit discharges.

Describe what the City has done to implement a program to detect and eliminate illicit discharges, and provide a written copy of the documents that comprise the program. Submission of a written IDDE Plan that includes a protocol for detection and elimination of illicit discharges would constitute a thorough response to this question. If no such written program exists, provide a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such a program. Attachment 5 provides a recommended framework for illicit discharge detection that can be conducted at stormwater outfalls, as well as upstream within the MS4.

- F. Explain whether the City has conducted any IDDE investigations and provide the following information for each IDDE investigation that the City has conducted since May 1, 2010:
1. The basis for the City suspecting the presence of an illicit discharge (including dry weather flow), and when the City became aware of this information;
 2. The City MS4 outfall from which the suspected illicit discharge was released or continues to be released;
 3. The water body to which the City MS4 outfall discharged or discharges, the Surface Water Classification for the waterbody, and whether a Total Maximum Daily Load ("TMDL") has been established for the water body;
 4. The actions the City has taken to trace the source(s) of the illicit discharge;

5. Whether the City determined the source(s) of the illicit discharge;
6. Whether the illicit discharge has been eliminated, and if so when;
7. If the illicit discharge has not been eliminated, the City's plans to eliminate the illicit discharge;
8. The entity that eliminated the illicit discharge (i.e., the City or a private entity); and
9. How much time elapsed between the notification or identification of the source(s) of the illicit discharge and the elimination of the illicit discharge.

Construction Site Stormwater Runoff Control

- G. Section 6.(a)(4)(A)(i) of the MS4 Permit requires the City to develop, implement, and enforce a program to reduce pollutants...from construction activities that result in land disturbance of greater than or equal to one acre (i.e. "Construction Sites").
1. Describe whether the City has adopted a regulatory mechanism to require sediment and erosion control at Construction Sites.

If the City has adopted a regulatory mechanism to require sediment and erosion control at Construction Sites, provide a copy. If no such regulatory mechanism exists, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and enforce such a regulatory mechanism.

2. Describe the City's procedures for notifying developers and operators of their duty to implement and maintain stormwater control measures;
3. Describe whether the City has implemented procedures for site plan reviews, inspections, and enforcement of control measures at Construction Sites.

If the City has implemented procedures for site plan reviews, inspections and enforcement of control measures at Construction Sites, provide a written copy of those procedures. A thorough response would include a list of the Construction Sites contributing runoff to the MS4 since May 1, 2010, as well as a list of, and description of, the inspections and enforcement performed by the City for those construction sites. If no such written procedures exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such procedures.

Post-Construction Stormwater Management in New Development and Redevelopment

- H. Sections 6.(a)(5)(A)(i) - (iv) of the MS4 Permit require the City to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects of less than one acre that are part of a larger common plan of development or sale, that

discharge into the MS4 or directly to waters of the State ("New Development and Redevelopment").

1. Describe whether the City has adopted a regulatory mechanism to address post-construction runoff from New Development and Redevelopment.

If the City has adopted a regulatory mechanism to address post-construction runoff from New Development and Redevelopment, provide a copy. If no such regulatory mechanism exists, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and enforce such a regulatory mechanism.

2. Describe whether the City has implemented procedures to ensure adequate long-term operation and maintenance of Stormwater Control Measures.

If the City has implemented strategies that include Stormwater Control Measures and procedures to ensure adequate long-term operation and maintenance of Stormwater Control Measures, provide a written copy of these strategies and procedures. A thorough response would include a list of the applicable Stormwater Control Measures built since May 1, 2010, and a description of the procedures in place for each. If no such written procedures exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such procedures.

Pollution Prevention and Good Housekeeping in Municipal Operations

- I. Section 6.(a)(6)(A) of the MS4 Permit requires that the City (i) develop and implement an operation and maintenance program that includes a training component for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations; (ii) develop and implement a program to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance; and (iii) develop and implement programs to sweep all streets at least once a year as soon as possible after snowmelt and clean catch basins and other stormwater structures that accumulate sediment at least once a year, including a provision to identify and prioritize those structures that may require cleaning more than once a year.

Describe whether the City has (i) implemented a program with a goal of preventing and/or reducing pollutant runoff from municipal operations, (ii) implemented procedures for fleet maintenance, park and open space as well as building maintenance activities, and (iii) developed and implemented programs and schedules to street sweep and clean catch basins.

If the City has (i) implemented a program with a goal of preventing and/or reducing pollutant runoff from municipal operations, (ii) implemented procedures for fleet maintenance, park and open space as well as building maintenance activities, and (iii) developed and implemented programs for maintenance and building maintenance activities, provide written copies of these programs, procedures, and schedules. A

thorough response to parts (i) and (ii) of this question would include a description of the City's maintenance activities (including schedules for these activities) performed at the Public Facility's garage and other municipal facilities such as fire and police stations and a schedule for maintenance activities at these locations. If no such programs, procedures, and/or schedules exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and implement such programs, procedures, and schedules.

- J. Section 6.(k) of the MS4 Permit requires that if a Total Maximum Daily Load ("TMDL") is approved for any waterbody into which the permittee discharges stormwater, the permittee must review its Stormwater Management Plan if the TMDL includes requirements for control of stormwater discharges. Provide a list of all water bodies with approved TMDLs that the City's MS4 discharges into, and whether those TMDLs include requirements for the control of stormwater discharges that apply to the City.

Describe whether the City has reviewed its Stormwater Management Plan to include the stormwater control requirements of the TMDLs associated with water bodies into which MS4 outfalls discharge.

If the City has not conducted this type of review, provide a schedule that explains the process and specifies the date(s) by which the City plans to address TMDL requirements within its Stormwater Management Plan.

- K. Laboratory sampling analysis reports submitted by the City to CTDEEP in 2010 demonstrate that the stormwater discharge from the KGI Bridgeport Company – East on September 16, 2010, had concentrations of bacteria greater than Connecticut water quality standards (State of Connecticut Regulations Section 22a-426), as well as a concentration of ammonia above 7 mg/L.

If the City has not tracked and confirmed the source of the bacteria or any other water quality exceedance in these samples provide a schedule that explains the process and specifies the date(s) by which the City plans to complete these IDDE investigations. EPA recommends the use of the EPA New England Bacterial Source Tracking Protocol (Attachment 5) that includes a number of in-field monitoring analysis at appropriate locations in the MS4 to trace the source of the elevated (greater than 0.25 mg/L) ammonia concentrations.

End of Questions

Attachment No. 3

Statement of Certification

I declare under penalty of perjury that I am authorized to respond on behalf of the City of Bridgeport. I certify that the foregoing responses and information submitted were prepared under my direction or supervision and that I have personal knowledge of all matters set forth in the responses and the accompanying information. I certify that the responses are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

By _____
(Signature)

(Printed Name)

(Title)

(Date)

Attachment 4

United States Environmental Protection Agency, EPA New England

Wastewater Collection System CMOM Program Self-Assessment Checklist

Apr 08

Name of your system _____ Date _____

Put an "A" in the final column for an issue you intend to address with future action, or leave blank if you have evaluated your program as sufficient.

I. General Information – Collection System Description

I	Question	Response	*Act
1	How many people are served by your wastewater collection system?		
2	What is the number of service connections to your collection system? How many: Manholes? Pump stations? Feet (or miles) of sewer? Force mains? Siphons?		
3	What is the age of your system (e.g., 30% over 30 years, 20% over 50 years, etc.)?		
4	What type(s) of collection system map is/are available and what percent of the system is mapped by each method (e.g., paper only, paper scanned into electronic, digitized, interactive GIS, etc.)? When was the map(s) last updated?		
5	If you have a systematic numbering and identification method/system established to identify sewer system manhole, sewer lines, and other items (pump stations, etc.), please describe.		
6	Are "as-built" plans (record drawings) or maps available and used by field crews in the office and in the field?		
7	Describe the type of asset management (AM) system you use (e.g. card catalog, spreadsheets, AM software program, etc.)		

II. Continuing Sewer Assessment Plan

II	Question	Response	*Act
1	Under what conditions, if any, does the collection system overflow? Does it overflow		

* Put an "A" in the final column if this is an issue you intend to address with future action.

	during wet and/or dry weather? Has your system had problems with: hydraulic issues, debris, roots, Fats, Oils & Grease (FOG), vandalism blockages resulting in manhole overflows, basement backups, other (specify)? Describe your system's history of structural collapses, and PS or force main failures.		
2	How many SSOs have occurred in each of the last three calendar years? What is the most frequent cause?		
3	Of those SSOs, how many basement backups occurred in each of the last three calendar years? How are they documented?		
4	What is the ratio of peak wet-weather flow to average dry-weather flow at the wastewater treatment plant or municipal boundary for satellite collection systems?		
5	What short-term measures have been implemented or plan to be implemented to mitigate the overflows? If actions are planned, when will they be implemented?		
6	What long-term measures have been implemented or plan to be implemented to mitigate the overflows? If actions are planned, when will they be implemented?		
7	Describe your preventive maintenance program; how do you track it (e.g., card files, electronically, with specific software)?		
8	How do you prioritize investigations, repairs and rehabilitation? What critical and priority problem areas are addressed more frequently than the remainder of your system? How frequent are these areas evaluated?		
9	Are septage haulers required to declare the origin of their "load"? Are records of these declarations maintained? Do any of the declarations provide evidence of SSOs?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

III.A. Collection System Management Organizational Structure

IIIA	Question	Response	*Act
1	Do you have an organizational chart that shows the overall personnel structure for collection system operations, including operation and maintenance staff? Please attach your chart.		
2	For which jobs do you have up-to-date job descriptions that delineate responsibilities and authority for each position?		
3	How many staff members are dedicated to collection system maintenance? Of those, how many are responsible for any other duties, (e.g., road repair or maintenance, O&M of the storm water collection system)?		
4	Are there any collection system maintenance position vacancies? How long has the position(s) been vacant?		
5	For which, if any, maintenance activities do you use an outside contractor?		
6	Describe any group purchase contracts you participate in.		

III.B. Collection System Management: Training

IIIB	Question	Response	*Act
1	What types of training are provided to staff?		
2	Is training provided in the following areas: general safety, routine line maintenance, confined space entry, <input type="checkbox"/> MSDS <input type="checkbox"/> lockout/tagout, biologic hazards, traffic control, record keeping, electrical and instrumentation, pipe repair, public relations, SSO/emergency response, pump station operations and maintenance, trench/shoring, other (describe)?		
3	Which training requirements are mandatory for key employees?		
4	How many collection system employees are certified (e.g, NEWEA certification program) and at what grade are they certified?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

III.C. Collection System Management: Communication and Customer Service

IIIC	Question	Response	*Act
1	Describe your public education/outreach programs (e.g., for user rates, FOG, extraneous flow, SSOs etc.)?		
2	What are the most common collection system complaints? How many complaints have you received in each of the past three calendar years?		
3	Are formal procedures in place to evaluate and respond to complaints?		
4	How are complaint records maintained (i.e., computerized)? How are complaints tied to emergency response and operations and maintenance programs?		

III.D. Collection System Management: Management Information Systems

IIID	Question	Response	*Act
1	How do you manage collection system information? (Commercial software package, spreadsheets, data bases, SCADA, etc). What information and functions are managed electronically?		
2	What procedures are used to track and plan collection system maintenance activities?		
3	Who is responsible for establishing maintenance priorities? What records are maintained for each piece of mechanical equipment within the collection system?		
4	What is the backlog for various types of work orders?		
5	How do you track emergencies and your response to emergencies? How do you link emergency responses to your maintenance activities?		
6	What written policies/protocols do you have for managing and tracking the following information: complaint work orders, scheduled work orders, customer service, scheduled preventative maintenance, scheduled inspections, sewer system inventory, safety incidents, emergency		

* Put an "A" in the final column if this is an issue you intend to address with future action.

	responses, scheduled monitoring/sampling, compliance/overflow tracking, equipment/tools tracking, parts inventory?		
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III.E. Collection System Management: SSO Notification Program

III E	Question	Response	*Act
1	What are your procedures, including time frames, for notifying state agencies, health agencies, regulatory authorities, and the drinking water authorities of overflow events?		
2	Do you use the state standard form for recording/reporting overflow events? If not, provide a sample copy of the form that is used.		

III.F. Collection System Management: Legal Authority

III F	Question	Response	*Act
1	Are discharges to the sewer regulated by a sewer use ordinance (SUO)? Does the SUO contain procedures for controlling and enforcing the following: FOG; Infiltration/Inflow (I/I); building structures over the sewer lines; storm water connections to sanitary lines; defects in service laterals located on private property; sump pumps?		
2	Who is responsible for enforcing various aspects of the SUO? Does this party communicate with your department on a regular basis?		
3	Summarize any SUO enforcement actions/activities that have occurred in the last three calendar years.		
4	Do you have a program to control FOG entering the collection system? If so, which of the following does it include: permits, inspection enforcement? Are commercial grease traps inspected regularly and who is responsible for conducting inspections?		
5	Is there an ordinance dealing with storm water connections or requirements to remove storm water connections?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

6	Does the collection system receive flow from satellite communities? Which communities? How are flows from these satellite communities regulated? Are satellite flow capacity issues periodically reviewed?		
7	Does the collection system receive flow from private collection systems? If yes, how is flow from these private sources regulated? How are overflows dealt with?		

IV.A. Collection System Operation: Financing

IV A	Question	Response	*Act
1	Has an enterprise (or other) fund been established and what does it include: wastewater collection and treatment operations; collection system maintenance; long-term infrastructure improvements; etc.? Are the funds sufficient to properly fund future system needs?		
2	How are rates calculated (have you done a rate analysis)? What is the current sewer charge rate? When was it last increased? How much was the increase?		
3	What is your O&M budget?		
4	If an enterprise fund has not been established, how are collection system maintenance operations funded?		
5	Does a Capital Improvement Plan (CIP) that provides for system repair/replacement on a prioritized basis exist? What is the collection system's average annual CIP budget?		
6	How do you account for the value of your system infrastructure for the Government Accounting Standards Board standard 34 (GASB 34)?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

IV.B. Collection System Operation: Hydrogen Sulfide Monitoring and Control

IV B	Question	Response	*Act
1	Are odors a frequent source of complaints? How many have been received in the last calendar year?		
2	Do you have a hydrogen sulfide problem, and if so, do you have corrosion control programs? What are the major elements of the program?		
3	Does your system contain air relief valves at the high points of the force main system? How often are they inspected? How often are they exercised?		

IV.C. Collection System Operation: Safety

IV C	Question	Response	*Act
1	Do you have a formal Safety Training Program? How do you maintain safety training records?		
2	Which of the following equipment items are available and in adequate supply: <input type="checkbox"/> rubber/disposable gloves; <input type="checkbox"/> confined space ventilation equipment; <input type="checkbox"/> hard hats, <input type="checkbox"/> safety glasses, <input type="checkbox"/> rubber boots; <input type="checkbox"/> antibacterial soap and first aid kit; <input type="checkbox"/> tripods or non-entry rescue equipment; <input type="checkbox"/> fire extinguishers; <input type="checkbox"/> equipment to enter manholes; <input type="checkbox"/> portable crane/hoist; <input type="checkbox"/> atmospheric testing equipment and gas detectors; <input type="checkbox"/> oxygen sensors; <input type="checkbox"/> H ₂ S monitors; <input type="checkbox"/> full body harness; <input type="checkbox"/> protective clothing; <input type="checkbox"/> traffic/public access control equipment; <input type="checkbox"/> 5-minute escape breathing devices; <input type="checkbox"/> life preservers for lagoons; <input type="checkbox"/> safety buoy at activated sludge plants; <input type="checkbox"/> fiberglass or wooden ladders for electrical work; <input type="checkbox"/> respirators and/or self-contained breathing apparatus; <input type="checkbox"/> methane gas or OVA analyzer; <input type="checkbox"/> LEL metering?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

	line segments that have chronic problems and should be cleaned more frequently? Is a list of these areas maintained and cleaning frequencies established?		
4	Approximately, how many collection system blockages have occurred during the last calendar year, and what were the causes?		
5	Has the number of blockages increased, decreased, or stayed the same over the past five years?		
6	What equipment is available to clean sewers? Is any type of cleaning contracted to other parties? If yes, under what circumstances?		
7	Do you have a root control program? Describe its critical components.		

V.B. Equipment and Collection System Maintenance: Maintenance Right-of-Way

V B	Question	Response	*Act
1	Is scheduled maintenance performed on Rights-of-Way and Easements? At what frequency? How many manholes in easement areas can not be located?		
2	Are road paving projects coordinated with the collection system operators. Are manholes paved over? How many manholes in paved areas can not be located? Describe any systems in place for locating and raising manholes that have been paved over.		

V.C. Equipment and Collection System Maintenance: Parts Inventory

V C	Question	Response	*Act
1	Do you have a central location for the storage of spare parts?		
2	How have critical spare parts been identified?		
3	How to you determine if adequate supplies on hand? Has an inventory tracking system been implemented?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

VI A. SSES: System Assessment

VI A	Question	Response	*Act
1	Do POTW flow records or prior I/I or SSES programs indicate the presence of public/private inflow sources or sump pumps? Please Explain.		
2	If problems are related to I/I, has a Sewer System Evaluation Survey (SSES) been conducted? When? What is the status of the recommendations?		
3	Do you have a program to identify and eliminate sources of I/I into the system including private service laterals and illegal connections? If so, describe.		
4	Have private residences been inspected for sump pumps and roof leader connections?		
5	Are inspections to identify illicit connections conducted during the property transfer process?		
6	How many sump pumps and roof leaders have been identified? How many have been removed?		
7	Have follow-up homeowner inspections been conducted?		
8	What incentive programs exist to encourage residences to disconnect roof leaders & sump pumps? i.e. matching funds, etc.		
9	What disincentive programs exist to encourage residences to disconnect roof leaders & sump pumps? i.e. fines, surcharges		

VI.B. SSES: Manhole Inspection

VI B	Question	Response	*Act
1	Do you have a manhole inspection and assessment program?		
2	Has a formal manhole inspection checklist been developed?		
3	How many manholes were inspected during the past calendar year?		

* Put an "A" in the final column if this is an issue you intend to address with future action.

VII. Energy Use

VII	Question	Response	*Act
1	What is your annual energy cost for operating your system? For which pieces of equipment do you track energy use?		
2	Have you upgraded any of your pumps and motors to more energy efficient models? If so, please describe.		
3	Have you performed an energy audit in the past three years?		
4	Where do you use the most energy (fuel, electricity) in operating your collection system?		
5	If you have a treatment plant, would you be interested in participating in EnergyStar benchmarking of your treatment plant?		

VIII. Other Actions

VIII	Question	Response	*Act
1	Describe any other actions that you plan to take to improve your CMOM Program that are not discussed above.		

* Put an "A" in the final column if this is an issue you intend to address with future action.

Attachment No. 5

EPA New England Bacterial Source Tracking Protocol

EPA New England Bacterial Source Tracking Protocol

Draft – January 2012

Purpose

This document provides a common framework for EPA New England (“EPA-NE”) staff to develop and implement bacterial source tracking sample events, and provides a recommended approach to watershed association, municipal, and State personnel. Adopted from Boston Water and Sewer Commission (“BWSC”) (2004), Pitt (2004), and based upon fieldwork conducted and data collected by EPA-NE, the protocol relies primarily on visual observations and the use of field test kits and portable instrumentation during dry and wet weather to complete a screening-level investigation of stormwater outfall discharges or flows within the drainage system. When necessary, the addition of more conclusive chemical markers may be included. The protocol is applicable to most typical Municipal Separate Storm Sewer Systems (“MS4s”) and smaller tributary streams. The smaller the upstream catchment area and/or more concentrated the flow, the greater the likelihood of identifying an upstream wastewater source.

Introduction

The protocol is structured into several phases of work that progress through investigation planning and design, laboratory coordination, sample collection, and data evaluation. The protocol involves the concurrent collection and analyses of water samples for surfactants, ammonia, total chlorine, and bacteria. When more precise confirmation regarding the presence or absence of human sanitary sewage is necessary, and laboratory capacity is available, the additional concurrent collection of samples for select Pharmaceutical and Personal Care Product (“PPCP”) analysis is advised. When presented with a medium to large watershed or numerous stormwater outfalls, the recommended protocol is the screening of all outfalls using the surfactant, ammonia, total chlorine, and bacterial analyses, in addition to a thorough visual assessment. The resulting data and information should then be used to prioritize and sample a subset of outfalls for all parameters, including PPCP compounds and additional analyses as appropriate. Ideally, screening-level analyses can be conducted by state, municipal, or local watershed association personnel, and a prioritized sub-set of outfalls can be sampled through a commercial laboratory or by EPA-NE using more advanced confirmatory techniques.

Step I – Reconnaissance and Investigation Design

Each sample event should be designed to answer a specific problem statement and work to identify the source of contamination. Any relevant data or reports from State, municipal, or local watershed associations should be reviewed when selecting sample locations. Aerial photography, mapping services, or satellite imagery resources are available free to the public through the internet, and offer an ideal way to pre-select locations for either field verification or sampling.

Sample locations should be selected to segregate outfall sub-catchment areas or surface waters into meaningful sections. A common investigative approach would be the identification of a specific reach of a surface water body that is known to be impaired for bacteria. Within this

specific reach, stormwater outfalls and smaller tributary streams would be identified by desktop reconnaissance, municipal outfall mapping, and field investigation when necessary. Priority outfalls or areas to field verify the presence of outfalls should be selected based on a number of factors, including but not limited to the following: those areas with direct discharges to critical or impaired waters (e.g. water supplies, swimming beaches); areas served by common/twin-invert manholes or underdrains; areas with inadequate levels of sanitary sewer service, Sanitary Sewer Overflows ("SSOs") or the subject of numerous/chronic sanitary sewer customer complaints; formerly combined sewer areas that have been separated; culverted streams, and; outfalls in densely populated areas with older infrastructure. Pitt (2004) provides additional detailed guidance.

When investigating an area for the first time, the examination of outfalls in dry-weather is recommended to identify those with dry-weather flow, odor, and the presence of white or gray filamentous bacterial growth that is common (but not exclusively present) in outfalls contaminated with sanitary sewage (see Attachment 1 for examples). For those outfalls with dry-weather flow and no obvious signs of contamination, one should never assume the discharge is uncontaminated. Sampling by EPA-NE staff has identified a number of outfalls with clear, odorless discharges that upon sampling and analyses were quite contaminated. Local physical and chemical conditions, in addition to the numerous causes of illicit discharges, create outfall discharges that can be quite variable in appearance. Outfalls with no dry-weather flow should be documented, and examined for staining or the presence of any obvious signs of past wastewater discharges downstream of the outfall.

As discussed in BWSC (2004), the protocol may be used to sample discreet portions of an MS4 sub-catchment area by collecting samples from selected junction manholes within the stormwater system. This protocol expands on the BWSC process and recommends the concurrent collection of bacteria, surfactant, ammonia, and chlorine samples at each location to better identify and prioritize contributing sources of illicit discharges, and the collection of PPCP compounds when more conclusive source identification is necessary.

Finally, as discussed further in Step IV, application of this sampling protocol in wet-weather is recommended for most outfalls, as wet-weather sampling data may indicate a number of illicit discharge situations that may not be identified in dry weather.

Step II – Laboratory Coordination

All sampling should be conducted in accordance with a Quality Assurance Project Plan ("QAPP"). A model QAPP is included as Attachment 2. While the QAPP details sample collection, preservation, and quality control requirements, detailed coordination with the appropriate laboratory staff will be necessary. Often sample events will need to be scheduled well in advance. In addition, the sampling team must be aware of the strict holding time requirements for bacterial samples – typically samples analysis must begin within 6 hours of sample collection. For sample analyses conducted by a commercial laboratory, appropriate coordination must occur to determine each facilities respective procedures and requirements. The recommendations in this protocol are based on the use of a currently unpublished EPA-NE

modification to *EPA Method 1694 – Pharmaceuticals and Personal Care Products in Water, Soil, Sediment, and Biosolids by HPLC/MS/MS*. Several commercial laboratories may offer Method 1694 capability. EPA-NE recommends those entities wishing to utilize a contract laboratory for PPCP analyses ensure that the laboratory will provide quantitative analyses for acetaminophen, caffeine, cotinine, carbamazepine, and 1,7-dimethylexanthine, at Reporting Limits similar to those used by EPA-NE (See Attachment 3). Currently, the EPA-NE laboratory has limited capacity for PPCP sampling, and any proposed EPA-NE PPCP sample events must be coordinated well in advance with the appropriate staff.

Step III – Sample Collection

Once a targeted set of outfalls has been selected, concurrent sampling and analyses for surfactants, ammonia, and total chlorine (which can all be done through the use of field kits), in addition to bacteria (via laboratory analysis) should be conducted. When numerous outfalls with dry-weather flow exist, sample locations should be prioritized according to the criteria mentioned above. In addition, field screening using only the field kits may occur during the field reconnaissance. However, it must be emphasized that the concurrent sampling and analyses of bacteria, surfactant, ammonia, and total chlorine parameters is the most efficient and cost-effective screening method.

When first observed, the physical attributes of each outfall or sampling location should be noted for construction materials, size, flow volume, odor, and all other characteristics listed on the data collection form (Attachment 4). In addition, GPS coordinates should be collected and a photograph of the sample location taken. Whenever possible, the sampling of storm drain outfalls should be conducted as close to the outfall opening as possible. Bacterial samples should be collected first, with care to not disturb sediment materials or collect surface debris/scum as best possible. A separate bottle is used to collect a single water sample from which aliquots will be analyzed for surfactants, ammonia, and total chlorine. A sample for PPCP analysis is recommended to be collected last, as the larger volume required and larger bottle size may cause some sediment disturbance in smaller outfalls or streams. If necessary, a second smaller, sterile and pre-cleaned sampling bottle may be used to collect the surface water which can then be poured into the larger PPCP bottle. Last, a properly calibrated temperature/specific conductance/salinity meter should be used to record all three parameters directly from the stream or outfall. When flow volume or depth is insufficient to immerse the meter probe, a clean sample bottle may be utilized to collect a sufficient volume of water to immerse the probe. In such instances, meter readings should be taken immediately.

As soon as reasonably possible, sample aliquots from the field kit bottle should be analyzed. When concurrent analyses are not possible, ammonia and chlorine samples should be processed first, followed by surfactant analysis, according to each respective Standard Operating Procedure as appropriate based on the particular brand and type of field test kit being used. All waste from the field test kits should be retained and disposed of according to manufacture instructions. Where waste disposal issues would otherwise limit the use of field kits, EPA-NE recommends that, at a minimum, ammonia test strips with a Reporting Limit below 0.5 mg/L be utilized. Such test strips typically are inexpensive and have no liquid reagents associated with their use.

Results should be recorded, samples placed in a cooler on ice, and staff should proceed to the next sample location.

Upon completion of sampling and return to the laboratory, all samples will be turned over to the appropriate sample custodian(s) and accompanied by an appropriate Chain-of-Custody ("COC") form.

Step IV – Data Evaluation

Bacterial results should be compared to the applicable water quality standards. Surfactant and ammonia concentrations should be compared to the thresholds listed in Table 1. Evaluation of the data should include a review for potential positive results due to sources other than human wastewater, and for false negative results due to chemical action or interferences. In the EPA-NE region, field sampling has indicated that the biological breakdown of organic material in historically filled tidal wetlands may cause elevated ammonia readings, as can the discharge from many landfills. In addition, salinity levels greater than 1 part per thousand may cause elevated surfactant readings, the presence of oil may likewise indicate elevated levels, and fine suspended particulate matter may cause inconclusive surfactant readings (for example, the indicator ampule may turn green instead of a shade of blue). Finally, elevated chlorine from leaking drinking water infrastructure or contained in the illicit wastewater discharge may inhibit bacterial growth and cause very low bacterial concentrations. Any detection of total chlorine above the instrument Reporting Limit should be noted.

Table 1 – Freshwater Water Quality Criteria, Threshold Levels, and Example Instrumentation ¹

Analyte/ Indicator	Threshold Levels/ Single Sample ³	Instrumentation
E. coli ²	235 cfu/100ml	Laboratory via approved method
Enterococci ²	61 cfu/100ml	Laboratory via approved method
Surfactants (as MBAS)	≥ 0.25 mg/l	MBAS Test Kit (e.g. CHEMetrics K-9400)
Ammonia (NH ₃)	≥ 0.5 mg/l	Ammonia Test Strips (e.g. Hach brand)
Chlorine	> Reporting Limit	Field Meter (e.g. Hach Pocket Colorimeter II)
Temperature	See Respective State Regulations	Temperature/Conductivity/Salinity Meter (e.g. YSI Model 30)

¹ The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

² 314 CMR 4.00 MA - Surface Water Quality Standards - Class B Waters.

³ Levels that may be indicative of potential wastewater or washwater contamination

Once dry-weather data has been examined and compared to the appropriate threshold values, outfalls or more discreet reaches of surface water can be selected for sampling or further

investigation. Wet-weather sampling is also recommended for all outfalls, in particular for those that did not have flow in dry weather or those with dry-weather flow that passed screening thresholds. Wet-weather sampling will identify a number of situations that would otherwise pass unnoticed in dry weather. These wet-weather situations include, but are not limited to the following: elevated groundwater that can now cause an exchange of wastewater between cracked or broken sanitary sewers, failed septic systems, underdrains, and storm drains; increased sewer volume that can exfiltrate through cracks in the sanitary piping; increased sewer volume that can enter the storm drain system in common manholes or directly-piped connections to storm drains; areas subject to capacity-related SSO discharges, and; illicit connections that are not carried through the storm drain system in dry-weather.

Step V – Costs

Use of field test kits and field instruments for a majority of the analytical parameters allows for a significantly reduced analytical cost. Estimated instrument costs and pro-rated costs per 100 samples are included in Table 2. The cost per 100 samples metric allows averaged costs to account for reagent refills that are typically less expensive as they do not include the instrument cost, and to average out the initial capital cost for an instrument such as a temperature/conductivity/salinity meter. For such capital costs as the meters, the cost over time will continue to decrease.

Table 2 – Estimated Field Screening Analytical Costs ¹

Analyte/ Indicator	Instrument or Meter ²	Instrument or Meter Cost/No. of Samples	Cost per Sample (Based on 100 Samples) ³
Surfactants (as MBAS)	Chemetrics K- 9400	\$77.35/20 samples (\$58.08/20 sample refill)	\$3.09
Ammonia (NH ₃)	Hach brand 0 – 6 mg/l	\$18.59/25 samples	\$0.74
Total Chlorine	Hach Pocket Colorimeter II	\$389/100 samples (\$21.89 per 100 sample refill)	\$3.89
Temperature/ Conductivity/ Salinity	YSI	\$490 (meter and cable probe)	\$4.90

¹ Estimated costs as of February 2011

² The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

³ One-time meter costs and/or refill kits will reduce sample costs over time

From Table 2, the field analytical cost is approximately \$13 per outfall. Typical bacterial analyses costs can vary depending on the analyte, method, and total number of samples to be performed by the laboratory. These bacterial analyses costs can range from \$20 to \$60. Therefore, the analytical cost for a single outfall, based on the cost per 100 samples, ranges from

\$33 to \$73. As indicated above, these costs will decrease slightly over time due to one-time capitals costs for the chlorine and temperature/conductivity/salinity meters.

Step VI – Follow-Up

Once all laboratory data has been reviewed and determined final in accordance with appropriate quality assurance controls, results should be reviewed with appropriate stakeholders to determine next steps. Those outfalls or surface water segments that fail to meet the appropriate water quality standard, and meet or exceed the surfactant and ammonia threshold values, in the absence of potential interferences mentioned in Step IV, indicate a high likelihood for the presence of illicit connections upstream in the drainage system or surface water. Whereas illicit discharges are quite variable in nature, the exceedance of the applicable water quality standard and only the ammonia or surfactant threshold value may well indicate the presence of an illicit connection. When available, the concurrent collection and analyses of PPCP data can greatly assist in confirming the presence of human wastewater. However, such data will not be available in all instances, and the collective data set and information regarding the physical characteristics of each sub-catchment or surface water reach should be used to prioritize outfalls for further investigation. As warranted, data may be released to the appropriate stakeholders, and should be accompanied by an explanation of preliminary findings. Release of EPA data should be fully discussed with the case team or other appropriate EPA staff.

References Cited

Boston Water & Sewer Commission, 2004, *A systematic Methodology for the Identification and Remediation of Illegal Connections*. 2003 Stormwater Management Report, chap. 2.1.

Pitt, R. 2004 *Methods for Detection of Inappropriate Discharge to Storm Drain Systems*. Internal Project Files. Tuscaloosa, AL, in The Center for Watershed Protection and Pitt, R., *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*: Cooperative Agreement X82907801-0, U.S. Environmental Protection Agency, variously paged. Available at: <http://www.cwp.org>.

Instrumentation Cited (Manufacturer URLs)

MBAS Test Kit - CHEMetrics K-9400: <http://www.chemetrics.com/Products/Deterg.htm>

Portable Colorimeter – Hach Pocket Colorimeter II: <http://www.hach.com/>

Ammonia (Nitrogen) Test Strips: <http://www.hach.com/>

Portable Temperature/Conductivity/Salinity Meter: YSI Model 30:
<http://www.ysi.com/productsdetail.php?30-28>

Disclaimer: *The mention of trade names or commercial products in this protocol does not constitute endorsement or recommendation for use by the U.S. EPA.*